EPA WORK ASSIGNMENT NO. 83-4N03
UNDER
EPA CONTRACT NO. 68-01-7250

FINAL
OPERATION AND MAINTENANCE PLAN
A. L. TAYLOR SITE
BULLITT COUNTY, KENTUCKY
MAY 1988

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NOTICE

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1.0 INTRODUCTION

The purpose of this Operation and Maintenance Plan (O&M) is to provide observation and maintenance procedures to be followed during the closure and 30-year post-closure periods at the A.L. Taylor site near Brooks, Kentucky. Regularly scheduled observations and maintenance activities shall be performed to:

- Observe the exposed components of the landfill,
- Determine and document if potential problem areas exist at the site based on these observations,
- Correct any problem areas observed, and
- Sample the site monitor well system and surface waters to determine the effects of the landfill on the shallow groundwater system.

This O&M includes the following sections:

- Site Background
- Facilities Observations
- Maintenance and Repair Tasks
- Sampling and Analysis of Surface Water and Groundwater Monitor Wells.

2.0 SITE BACKGROUND

The A.L. Taylor site, also known as Valley of the Drums, is located immediately south of the City of Louisville, Kentucky. The site is located within Bullitt County, Kentucky at an approximate latitude of 38°04'55", longitude of 85°42'56". The 23-acre site is approximately 1.3 miles west of Interstate Highway 65 and 1.7 miles northwest of the community of Brooks, Kentucky.

The portions of the A.L. Taylor site which have not been impacted by the construction of the remedial facilities, approximately 17 acres, remain in woodlands and pasture. Roughly 6 acres have been enclosed by a security fence for protection of the remedial facilities. The land use adjacent to the site include a golf course to the southeast and undeveloped woodlands in all other directions for a distance of at least approximately 1,000 feet (ft) or more. Residential development is located approximately 2,000 ft to the northwest and to the east.

The elevations of the areas of the A.L. Taylor site on which remedial facilities were constructed range from approximately 500 feet, mean sea level (ft-msl) to 700 ft-msl. The site slopes generally to the east and southeast to Wilson Creek, a small intermittent stream that flows along the southeastern perimeter.

The A.L. Taylor site was first identified as a waste disposal site by the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) in 1967. The disposal site covered approximately 13 acres of the 23-acre tract owned by Mr. Taylor. Mr. Taylor excavated pits onsite, emptied the contents of drums into the pits, and recycled the drums. Thousands of drums were stored on the ground surface, especially during later years of operation. The initial drum inventory, conducted in 1979, showed that

11,628 of the 17,051 drums on the surface were empty. Four or five major cells of wastes containing liquids, sludges, and crushed drums were identified.

In 1980, KNREPC contacted six responsible parties (RPs) who identified and removed approximately 30 percent of the waste remaining on the surface. Following this removal, approximately 4,200 drums remained onsite. In 1981 the U.S. Environmental Protection Agency (EPA), responding under the emergency provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, removed the 4,200 drums remaining onsite. After the remaining drums were removed, the site was regraded to promote positive drainage toward Wilson Creek, thus reducing the amount of ponded water and minimizing surface erosion. An impoundment was excavated along the northwestern side of Wilson Creek prior to the 1981 drum removal to intercept surface runoff and shallow seepage draining from the waste disposal area toward the Creek. The water from the impoundment was discharged in 1987 to Wilson Creek.

During the 1981 emergency response, the volume of waste buried onsite was estimated to range between 193,312 and 339,312 cubic feet (ft^3) or 5,282 to 18,542 drums. The site contained waste deposited in cells scattered over the site. Investigations indicate there are 4 or 5 major cells of dumped wastes containing chemical liquids, sludges, and crushed drums.

Remedial measures including a clay cap, drainage system, monitor wells, and security fence were constructed in May through July of 1987. The cap consists of an impervious layer with a minimum of 36 inches of clay, an 18-inch pervious drainage layer (gravel), and a 12-inch topsoil layer with grass vegetative cover.

During the 1987 remedial activities specific areas were excavated, stabilized, and backfilled. Remediation of the Collection Pond was

reported by EPA Region IV personnel to include stabilization of pond sediments. Leachate collected in the main trench located along the south and eastern portion of the site was treated by carbon filtration and pumped back onto the surface of the fill area. During rough grading of the site (prior to placement of the cover system) two separate leachate seeps were encountered where fill was being placed in preparation for the clay cap. The two affected areas were excavated and leachate was pumped onto the adjacent ground surface where it infiltrated or volatile components evaporated. The larger of the two seeps at the north side of the area was excavated forming a pit with approximate dimensions of 8 ft long by 8 ft wide by 8 ft deep. Vegetation cleared from the construction area was placed in onsite pits and the pits backfilled. Clay for the cap was obtained from two local offsite borrow areas.

3.0 FACILITIES OBSERVATIONS

The following sections outline the frequencies and types of observations to be performed during the closure and 30-year post-closure period at the A.L. Taylor site. Each section includes:

- o A brief overview of the specific components to be observed,
- o The rationale for performing these specific observations, and
- o A detailed schedule of observation activities.

An O&M Field Observation Report form for the purpose of documenting these observations is given in Appendix A. Table 3-1 summarizes the observation frequencies and specific elements to be observed. Each year observations shall be performed once during the month of January and monthly from April through October.

To monitor settlement of the cover system, regularly scheduled topographic surveys shall be performed. Benchmarks will be installed at the site during the first year of operation and topographic surveys will be performed at the end of Years 1, 3, and 5, thereafter at the end of every 5th year until year 30. Any problems observed may result in additional surveys being completed to maintain closer records of conditions.

3.1 TOPSOIL/GRASS COVER

The design intent of the topsoil/grass cover is to reduce erosion of the landfill surface due to wind and surface water. Sections 3.1.1 through 3.1.6 describe specific elements of the topsoil/grass cover that require regularly scheduled observations during the closure and post-closure period. Observations and measurements obtained during these regular observations shall be recorded in the O&M Field Observation Report, Appendix A.

Table 3-1. Schedule for Frequency of Facility Observations
Operations and Maintenance Plan for the A.L. Taylor Site, Bullitt County, Kentucky

FACILITY OBSERVATION DESCRIPTION	YEARS 1 - 5 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEARS 6 - 30
Topsoil/Grass Cover (3.1)	X		X		X	X	X	X	X		X		Same as years 1 - 5
Terrace Slopes (3.1)	X		X		X	X	X	X	X		X		Same as years 1 - 5
Perimeter Drainage Ditch (3.2)	X		X		X	X	X	X	X		X		Same as years 1 - 5
Monitor Wells (3.3)	X		X		X	X	X	X	X		X		Same as years 1 - 5
Security Fence (3.4)	X		X		X	X	X	X	X		X		Same as years 1 - 5
Access Road (3.5)	X		X		X	X	X	X	X		X		Same as years 1 - 5
Soil pH and Nutrient Test (3.1.4)	(As Needed)												Same as years 1 - 5
Topographic Survey (3.1.1)	Annually during Years 1, 3, 5												Annually during Years 10, 15, 20, 25, and 30

Source: ESE, 1988.

Notes: 1. (3.x) refers to appropriate section of the facility's Operations and Maintenance Plan

3.1.1 Settlement of Cover

The landfill cap on each of the four terraces is sloped between 3 and 5 percent. Slopes in excess of 5 percent may result in accelerated erosion, while slopes less than 3 percent may not promote adequate surface water runoff and cause ponding of water. To maintain this range in slope, regular field observations and scheduled topographic surveys shall be performed. The two areas where leachate seeps occurred during cover construction (as described in Section 2.0) should be specifically observed for excessive settlement. These areas are located along the northern edge of Terrace 3 approximately 100 ft west of the double utility poles and along the southern edge of the capped area near the utility pole and immediately west of the access road.

Regular observations for settlement of the cover consists of walking the perimeter of the cap and making visual observations of the condition of the cover slopes. If visual observations indicate localized settlement within a 20-ft diameter area, field measurement by surveying in this area should be performed. Settlement greater than 6 inches in any 20-ft diameter area shall be considered major settlement and should be evaluated by a registered professional engineer specializing in geotechnical engineering. Settlement less than 6 inches in any 20-ft diameter area shall be considered minor settlement. Section 4.1.1 describes the maintenance actions to be taken to correct minor settlement of the cap.

As a further check for overall settlement of the landfill, topographic maps prepared from each survey shall be reviewed by a registered professional engineer specializing in geotechnical engineering. As a part of this review, topographic maps should be compared to the base line topographic map presented in the Closure Report for the A.L. Taylor site.

3.1.2 Soil Erosion

Soil erosion of the topsoil cover should be prevented to protect the underlying components of the cap. This observation consists of walking the entire area of the cap and making a visual observation for indications of erosional features such as:

* Swales greater than 1 ft wide and 2 inches deep,
* Cracks which may extend to the clay cap, and
* Areas of errosional damage to grass.

Section 4.2.1 describes the maintenance actions to correct soil erosion on the cap.

3.1.3 Leachate Seepage

During the 1987 remedial activities leachate seeps occurred at two locations in the cap area. Facility observations should include inspection of the cap and surrounding area for signs of leachate seeps. Indicators such as odor, unusual grass growth (including rapid growth due to moisture or localized die-off due to toxicity), lack of grass growth, or soggy soil should be noted. Seepage at the toe of a terrace slope may be the result of drainage of topsoil on the upper terrace to the lower terrace.

3.4.1 Adequate Growth of Grass Cover

Adequate growth of the grass cover is required to prevent wind and water erosion of the topsoil cover. Observations consist of walking the entire area of the cap and making visual observations for fertilization, watering, reseeding or other corrective measures.

If the grass in any area greater than 36 square feet does not exhibit adequate growth, this area shall be tested for adequate moisture and soil nutrients by taking a soil sample to be analyzed by the Kentucky Soil Conservation Service (SCS) Extension Office, Louisville, Kentucky, (502) 425-4482. These areas shall be watered, fertilized, and reseeded to insure adequate growth. Sections 4.3.1 and 4.3.2 describe the maintenance actions to insure adequate growth of the grass cover.

3.1.5 Ponded Water

The presence of ponded water on the cover may indicate settlement of the cover. Observations of the cover consist of identifying swales or areas of ponded water larger than 5 ft in diameter by 3 inches deep. Maintenance to repair areas of ponding are described in Section 4.1.1.

3.1.6. Mowing

Mowing requirements at the site include: (1) the cover and (2) other areas adjacent to the facilitites constructed at the site. Mowing requirements of these two areas are different.

The grass cover should be mowed periodically since excessive grass height reduces runoff away from the cover and may visually obstruct observation of the cover. Grass will be maintained at a maximum height of 8 inches during the first year and 1 ft for the remainder of the O&M period. Maintenance actions for mowing the grass cover are described in Section 4.3.1.

Areas adjacent to the riprap slopes, monitor wells, access roads, ash seepage barrier, and security fences should be mowed periodically to prevent the growth of vegetation which could damage the facility or inhibit access and visual inspection of the facilities. Mowing in these areas should be frequent enough to prevent growth of woody plants and other vegetation which grows to a height of more than 2 to 3 ft.

3.2 WILSON CREEK AND PERIMETER DRAINAGE DITCH SYSTEM

The perimeter drainage system is designed to control and direct the flow of surface water away from the landfill cover. Sections 3.2.1 through 3.2.3 describe specific elements of the drainage system that require regular observations. All observations and measurements obtained during the inspection shall be reported on the O&M Field Observation Report (see Appendix A).

3.2.1 Side Slope Sloughing

The riprap cover on the drainage ditch side slopes and bottom reduces erosion and provides slope stabilization for the side slopes. Erosion and sloughing of these slopes should be prevented to maintain the original channel alignment. Inspection of the drainage system consists of walking the length of the drainage ditch and making visual observations of the following:

- Sloughing,
- Sedimentation,
- Erosion,
- Uneven or irregular spacing of riprap, and
- Blockage of pipe culverts.

Section 4.2.2 describes the maintenance actions for repairing ditch slope sloughing.

3.2.2 Vegetation

Growth of vegetation within the perimeter drainage ditch system reduces the ditch system capacity. Observation of the drainage system consists of walking the length of the drainage ditch and making visual observations for vegetative growth. Maintenance actions to control vegetative growth in the drainage system are described in Section 4.3.3.

3.2.3 Ponding

Ponded water in the perimeter drainage ditch system indicates a flattening or settling of the ditch bottom slope, possibly due to settlement or localized erosion. Observation for ponding consists of identifying areas of ponded water larger than 16 square feet in plan dimension and greater than 3 inches deep. Maintenance actions to correct ponded water in the ditch are described in Section 4.1.3.

3.2.4 Sedimentation

Sediment accumulation exceeding 10% of the cross sectional area of the ditch should be removed. Care should be taken not to damage the riprap ditch lining. The material removed should be disposed of onsite in an appropriate location but not on the landfill cap. If a large amount of sediment is deposited in the ditch, for example, covering the ditch bottom for a length greater than approximetely 50 ft or a volume exceeding 300 cubic ft, the source of the sediment should be identified. Any remedial action should be directed by a registered professional engineer.

3.2.5 Culverts

Culverts should be inspected to detect damage to the headwalls or pipe ends and to look for blockage of the culvert by debris. Debris should be removed from the culvert and disposed of properly. Structural damage to the headwall, such as cracking, should be noted on inspection forms. Erosion of soils or riprap around the headwall should be repaired by backfilling and placement of riprap.

3.3 MONITOR WELLS

The monitor well network at the site will be used to determine the long term impact of the landfill on the shallow and deep groundwater aquifers at the site. Observations consist of visually examining each monitor well for the following:

* Well padlock,

- Condition of the protective casing,
- Presence of protective posts surrounding the well, and
- Condition of concrete pad.

Observations made during these inspections shall be recorded in the O&M Field Observation Report (see Appendix A). Maintenance actions to repair monitor wells are described in Section 4.5. Sampling and analysis of the groundwater samples are described in Section 5.0.

3.4 SECURITY FENCE

The security fence around the site restricts access for authorized personnel only. Observation of the security fence consists of walking the site perimeter and visually inspecting the general condition of the fence for the following:

- Holes,
- Structural deficiencies of the fence, posts, or gate,
- Security of the gate and lock, and
- Debris accumulation at the drainage ditch crossings.

An O&M Field Observation Report (see Appendix A) should be completed during each site inspection. Maintenance actions for the security fence are described in Section 4.6.

3.5 ACCESS ROAD

Maintenance of the access road must be performed to allow access to the site for regularly scheduled observations and periodic maintenance and inspection/maintenance of the powerline. Examination of the access road consists of addressing the general condition of the road for safety and accessibility to two-wheel drive vehicles. All inspections of the access road shall be recorded in the O&M Field Observation Report (see Appendix A). Maintenance tasks for the access road are described in Section 4.7.

4.0 MAINTENANCE TASKS

This section describes the types and frequencies of maintenance tasks required during the closure and post closure period at the A.L. Taylor site. The maintenance activities described in Section 4.1 through 4.7 are necessary for the maintenance and repair of the various components of the landfill. Table 4-1 summarizes appropriate maintenance activities for each facility.

4.1 MAINTENANCE AND REPAIR OF SETTLEMENT

This section describes the maintenance tasks associated with repairing settlement of the cover or the drainage ditch. If any specific areas require three consecutive maintenance efforts, then a registered professional engineer specializing in geotechnical engineering shall be contacted to evaluate the situation.

4.1.1 Minor Settlement of the Cover

Minor settlement of the cover (as described in Section 3.1.1) shall be repaired by refilling and recompacting topsoil in the area of subsidence, regrading the area to the design contours, and reseeding to encourage grass growth.

4.1.2 Major Settlement of the Cover

Major settlement of the cover (as described in Section 3.1.1) shall be evaluated by a registered professional engineer specializing in geotechnical engineering.

4.1.3 Settlement of the Drainage Ditch

Settlement beneath the drainage ditch that results in impaired flow shall be repaired by removing the riprap, refilling and recompacting the area with clay, regrading the clay ditch bottom, and replacing riprap.

Table 4-1. Maintenance Observations and Actions
Operations and Maintenance Plan, A.L. Taylor Site, Bullitt County, Kentucky

MAINTENANCE OBSERVATIONS	MAINTENANCE ACTION
** LANDFILL SURFACE **	
Grass cover taller than 4 inches	Mow grass
Presence of erosion, cracks, gullies	Fill in with topsoil and reseed
Presence of leachate seeps	See Section 4.4
Inadequate growth of grass cover	Reseed cover and increase watering
Presence of ponded water	Fill in areas to maintain slopes
Burrowing animals	Repair areas
** SETTLEMENT OF COVER **	
Minor settlement /sloughing of cover	Fill in with topsoil and reseed -- See Section 4.1.1
Major settlement of cover (Note 1)	See Section 4.1.2
** TERRACE SLOPES **	
Sloughing of riprap or slope failure	Place/compact clay, place riprap.
Vegetation	Remove manually or apply herbicide
** PERIMETER DRAINAGE DITCH **	
Sloughing of riprap	Replace riprap
Growth of vegetation	Remove all vegetation
Ponding of water	See Section 4.1.3
Blockage of pipe culverts	Clear debris, sediment
Erosion at culvert headwalls	Fill, compact, place riprap Fill in with topsoil and reseed
** MONITOR WELLS **	
Wells not locked, lock damaged	Replace lock
Well casing or pad damaged	See Section 4.5
Guard posts missing or damaged	Replace posts
** SECURITY FENCE **	
Gate unlocked, lock missing	Replace lock
Structural problems in fence	Repair fence
Holes in fence	Repair holes
Significant erosion beneath fence	Fill in with topsoil and reseed
Drainage ditch crossing	Remove debris, sediment, etc
ACCESS ROAD	
Erosion, potholes	Regrading

Source: ESE, 1988.

Notes: 1. Major settlement is classified as settlement in excess of 6 inches over an area of 20-ft. horizontal span

4.2 EROSION CONTROL

The following subsections describe the maintenance actions for the repair of erosion of the cover, terrace slopes, and drainage ditch slopes. If any specific area of erosion requires three consecutive maintenance efforts, then a registered professional engineer specializing in drainage/hydraulic engineering shall be contacted to evaluate the situation.

4.2.1 Topsoil Cover

Repairs for topsoil cover erosion shall consist of filling in areas of soil loss with new topsoil to maintain the required cap slope. Repaired areas shall be reseeded, fertilized, and watered to encourage grass growth.

4.2.2 Ditch Slopes

Sloughed or missing riprap on the drainage ditch slopes shall be replaced by either repositioning the existing riprap or by adding additional riprap. Every effort should be made to maintain the shape of the slope.

4.3 MAINTENANCE OF GRASS AND CONTROL OF VEGETATION

The following subsections describe the maintenance tasks associated with maintaining and insuring growth of the grass cover, and control of vegetation in the drainage ditch and exclusion zone.

4.3.1 Grass Cover Mowing and Maintenance

Grass will be maintained at a maximum height of 8 in during the first year and 1 ft for the remainder of the O&M period. To facilitate adequate growth, the grass shall be watered as needed

based on knowledge of local conditions or practices, or based on the advice from the Kentucky SCS. Matted grass and clippings shall be removed where such material does not allow adequate observation of the cover system.

4.3.2 Soil Testing for Fertilizer Requirements

Soil testing of the topsoil cover shall be performed on an as-needed basis for soil pH and nutrients by a qualified testing laboratory (e.g. the Kentucky SCS Extension Office, Louisville, Kentucky, (502) 425-4482) to determine the fertilizer requirements to maintain growth of the grass cover. Based on soil tests results, fertilizer should be applied based on the recommendations of the Kentucky SCS.

4.3.3 Vegetation Control in Drainage Ditch

Should vegetative growth significantly reduce the carrying capacity of the drainage ditch or adversely divert flow, action should be taken to remove the vegetation.

4.4 LEACHATE SEEPAGE

Seepage of excess topsoil moisture should be distinguished from leachate seepage, if possible. The potential occurrence of a leachate seep should be confirmed by sampling the seep or digging shallow excavations. The source of leachate seepage occurring at the face of a terrace may be difficult to determine since a seep occurring on the level portion of the terrace would indicate blockage of the drainage layer. Therefore, a registered professional engineer should be contacted to evaluate this situation further.

4.5 MAINTENANCE AND REPAIR OF MONITOR WELLS

Minor repairs of the monitor wells include replacing damaged or missing padlocks or guard posts. Wells that are found to be unlocked shall be locked immediately. Cracks in the concrete pads greater than 1/4 in wide shall be repaired with patching mortar. If the protective casings are damaged or cracked, a registered professional engineer specializing in groundwater hydrology should be contacted.

4.6 MAINTENANCE AND REPAIR OF SECURITY FENCE

Holes in the security fence shall be repaired, patched, or replaced with new sections of chain link fence fabric. Structural problems in the fence such as broken or damaged posts or gate shall be repaired. Broken or missing gate chain or lock shall be replaced or repaired. Debris or soil accumulation at the drainage ditch crossings should be removed.

.7 MAINTENANCE AND REPAIR OF ACCESS ROAD

Maintenance of the access road shall consist of repairing potholes or washouts and performing road regrading.

WATER QUALITY SAMPLING AND ANALYSIS

ılarly scheduled sampling and analysis of the surface water and
ındwater at the site will provide historical water quality and water
el data to determine the effects of the landfill on the shallow
ındwater system and surface runoff at the site. Table 5-1 summarizes
depths and well construction details of the 12 monitor wells at the
. Taylor site. Well logs showing construction details for the monitor
ıs are presented in Appendix B.

face water sampling should be performed at two points on Wilson Creek.
point is upstream of any runoff or shallow seepage received from the
dfill area and the other is downstream of any area contributing to
son Creek. Groundwater sampling shall be performed in the 12 monitor
s he site.

ing the 30-year post-closure period water quality sampling will be
ıducted according to the following schedule: quarterly in Years 1
ough 3, followed by one annual sampling each year during Years 4
ough 30. All procedures to be followed during sampling, transporting,
. laboratory analyses of the groundwater shall be performed in
cordance with current EPA protocols. A summary analytical parameter and
ıuired EPA laboratory protocol is presented in Table 5-2.

e analytical results must be evaluated in accordance with the procedures
clined in 40 CFR 264 Subpart F and shall be reported to the State of
ıtucky and USEPA Region IV.

Table 5-1. Monitor Well Construction Details
Operations and Maintenance Plan, A.L. Taylor Site, Bullitt County, KY

ITEM	WELL NUMBER											
	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6	ALT-7	ALT-8	ALT-9	ALT-10	ALT-11	ALT-12
Borehole diameter (in)	8	8	8	8	8	12	12	12	12	12	12	12
Well Diameter (in)	4	4	4	4	4	4	4	4	4	4	4	4
Total Depth (ft)	78.8	35.0	17.7	20.0	32.0	37.0	100.8	52.7	48.0	58.4	47.6	46.7
Screened Interval (depth - ft)	37.9-57.9	22.6-32.7	11.8-17.1	13.9-19.3	12.6-23.0	16.4-26.8	52.1-67.9	32.5-42.9	26.8-47.0	36.5-46.9	24.6-35	26.3-37.6
Sand Pack Interval (depth - ft)	35.0-58	20.0-33	11.0-17.2	11.4-19.5	9.0-26.0	15.0-27.5	50.8-71.6	30.3-45.0	20.0-47.0	34.0-47.5	19.0-44.5	24.2-40.4
Approximate Water Level (depth - ft)	17.0	2.5	2.0	9.4	23.5	25.6	-	14.1	10.3	46.0	16.5	18.5

SOURCES: Kentucky Department For Environmental Protection, 1988,
EPA, 1988.

Table 5-2. Analytical Parameters and Approved EPA Laboratory Protocols for Groundwater and Surface Water Samples A.L. Taylor Site, Operations and Maintenance Plan

Parameter Coverage	
Volatile Organic Compounds[1]	
Cloroethane	1,1,1-trichloroethane
1,1-dichloroethane	Vinyl chloride
1,1-dichloroethylene	Xylene
Toluene	Trichloroethylene
Ethylbenzene	Tetrachloroethylene
Benzene	1,2-trans-dichloroethylene
Base/Neutral and Acid Organic Compounds[2]	
Naphthalene	Phenanthrene
Phthalates	Pentachlorophenol
Anthracene	Phenol
Fluoranthene	Isophorone
3,3'-dichlorobenzidine	Acenaphthene
Fluorene	Pyrene
Hexachlorobenzene	
PCB Compounds[3]	
PCB-1242	
PCB-1248	
PCB-1254	
PCB-1260	

[1]Analysis by EPA Method 624.
[2]Analysis by EPA Method 625.
[3]Analysis by EPA Method SW846-9020, 608.

6.0 ESTIMATED OPERATIONS AND MAINTENANCE COSTS

Estimated costs for the performance of this O&M are presented in Table 6-1. The costs in Table 6-1 represent the present (1988) value of the anticipated costs of all facility observations, routine and non-routine maintenance tasks, and water quality sampling and analyses.

Table 6-1. Estimated Costs for Implementing Operations and Maintenance Plan
Operations and Maintenance Plan, A.L. Taylor Site, Bullitt County, Kentucky

ACTIVITY	No. of persons per trip	No. of trips per year	Labor hours per trip	Labor rate ($/hr)	Vehicle rate ($/day)	No. of Analytical Samples *	Cost per Analytical Sample	Fixed Costs ($)	Cost per trip ($)	Annual Cost	Required Years of O and M	Total Cost	Remarks
A. FACILITY OBSERVATIONS, SAMPLING, AND ANALYSIS													
Facility Observations	2	8	10	$15	$25				$325	$2,600	30	$78,000	
Observation Report	1	8	12	$15				$100	$280	$2,240	30	$67,200	
Water Quality													
Sampling (Years 1-3)	2	4	36	$15	$25			$200	$1,355	$5,420	3	$16,260	Quarterly sampling during
Analysis (Years 1-3)		4				16	$735	$760	$12,520	$50,080	3	$150,240	Years 1-3
Sampling (Years 4-30)	2	1	36	$15	$25			$200	$1,355	$1,355	27	$36,585	Annual sampling during
Analysis (Years 4-30)		1				16	$735	$760	$12,520	$12,520	27	$338,040	Years 4-30
B. ROUTINE MAINTENANCE ACTIVITIES													
Grass Cover Mowing	2	8	8	$15	$25			$50	$315	$2,520	30	$75,600	
Miscellaneous Mowing	2	2	8	$15	$25			$50	$315	$630	30	$18,900	
Weed and Tree Control	1	1	4	$15	$25			$100	$185	$185	30	$5,550	
Topographic Survey								$8,000	$8,000		8	$64,000	Years 1,3,5,10,15,20,25,30
Soil pH and Nutrient Test	1	1	2	$15	$25			$50	$105	$105	30	$3,150	
C. NON-ROUTINE MAINTENANCE ACTIVITIES													
Minor Settlement of Ditch or Cover	2	1	8	$15	$50			$100	$390	$390	30	$11,700	
Erosion Control (cover, ditch, terrace slopes)	3	4	8	$15	$50			$200	$610	$2,440	30	$73,200	
Monitor Wells	2	1	8	$15	$25			$100	$365	$365	30	$10,950	
Security Fence	2	1	8	$15	$25			$200	$465	$465	30	$13,950	
Access Road	2	1	8	$25	$120			$350	$870	$870	30	$26,100	
Grass Reseeding	2	1	8	$15	$25			$50	$315	$315	30	$9,450	
										TOTAL		$998,875	

* Includes 12 ground water samples, 2 surface water samples, 1 blank and 1 duplicate

Source: ESE, 1988.

NOTES: 1. ESTIMATED COSTS IN THIS TABLE ARE 1988 DOLLARS

7.0 REFERENCES

Conestoga-Rovers & Associates Limited. March 1986. Capping Proposal, A.L. Taylor Site, Bullitt County, KY.

Conestoga-Rovers & Associates Limited. April 1986. Preliminary Remedial Construction Design, A.L. Taylor Site, Bullitt County, KY.

United States Environmental Protection Agency (USEPA). June, 1986. Record of Decision (ROD) Remedial Alternative Selection, A.L. Taylor Site, Bullitt County, KY.

APPENDIX A

OPERATION AND MAINTENANCE
FIELD OBSERVATIONS REPORT FORMS

REPORT OF FIELD OBSERVATION
A. L. TAYLOR SITE, BROOKS, KENTUCKY

Observation Report No: _____ Date of Observation: ____/_____/____

Time Arrived Onsite: _____ Time Departed Site: _____

Field Personnel: _____

Section A: Topsoil/Grass Cover	Yes*	No	Not Observed	Comment No.
1. Minor settlement of cover	☐	☐	☐	_____
2. Major settlement of cover	☐	☐	☐	_____
3. Evidence of erosion, swales cracks, etc.	☐	☐	☐	_____
4. Evidence of leachate seepage	☐	☐	☐	_____
5. Inadequate growth of grass cover	☐	☐	☐	_____
6. Ponded water on cover	☐	☐	☐	_____
7. Grass height greater than 4 inches	☐	☐	☐	_____

Section B: Perimeter Drainage Ditch System	Yes*	No	Not Observed	Comment No.
1. Sloughing, erosion or vegetation on ditch side slopes	☐	☐	☐	_____
2. Vegetation growth in ditch channel	☐	☐	☐	_____
3. Ponded water, impairment of flow, sedimentation in ditch	☐	☐	☐	_____
4. Blockage of culverts	☐	☐	☐	_____

Section C: Monitoring Wells	Yes*	No	Not Observed	Comment No.
1. Wells locked	☐	☐	☐	_____
2. Guard posts missing or damaged	☐	☐	☐	_____
3. Protective casing missing or damaged	☐	☐	☐	_____
4. Concrete pads damaged or cracked	☐	☐	☐	_____
5. Possible surface water infiltration into wells	☐	☐	☐	_____

Section D: Security Fence	Yes*	No	Not Observed	Comment No.
1. Holes in fence	☐	☐	☐	_____
2. Structural problems with fence or gate	☐	☐	☐	_____
3. Gate unlocked	☐	☐	☐	_____
4. Broken or missing lock	☐	☐	☐	_____

Section E: Terrace Slopes	Yes*	No	Not Observed	Comment No.
1. Trees or bushes growing in zone	☐	☐	☐	_____
2. Sloughing or erosion of slopes	☐	☐	☐	_____

Section F: Access Road	Yes*	No	Not Observed	Comment No.
1. Pot holes, erosion of edge of road	☐	☐	☐	_____

*If yes, assign a comment no. in the last column and see page 2 for instructions.

Signature of Observer: _____ Date: _____

REPORT OF FIELD OBSERVATION
A. L. TAYLOR SITE, BROOKS, KENTUCKY

Observation Report No: _____ Date of Observation: ____/_____/_____

Instruction: If any item is checked yes, provide details of the problem and maintenance recommendations below and indicate the location deficiency on the site map on page 3.

Comment No:	Comment

Comment No.	Corrective Action Performed:

Signature of Observer: _____ Date: _____

REPORT OF FIELD OBSERVATION
A. L. TAYLOR SITE, BROOKS, KENTUCKY

Observation Report No: _____ Date of Observation: ____/_____/_____

Site Map

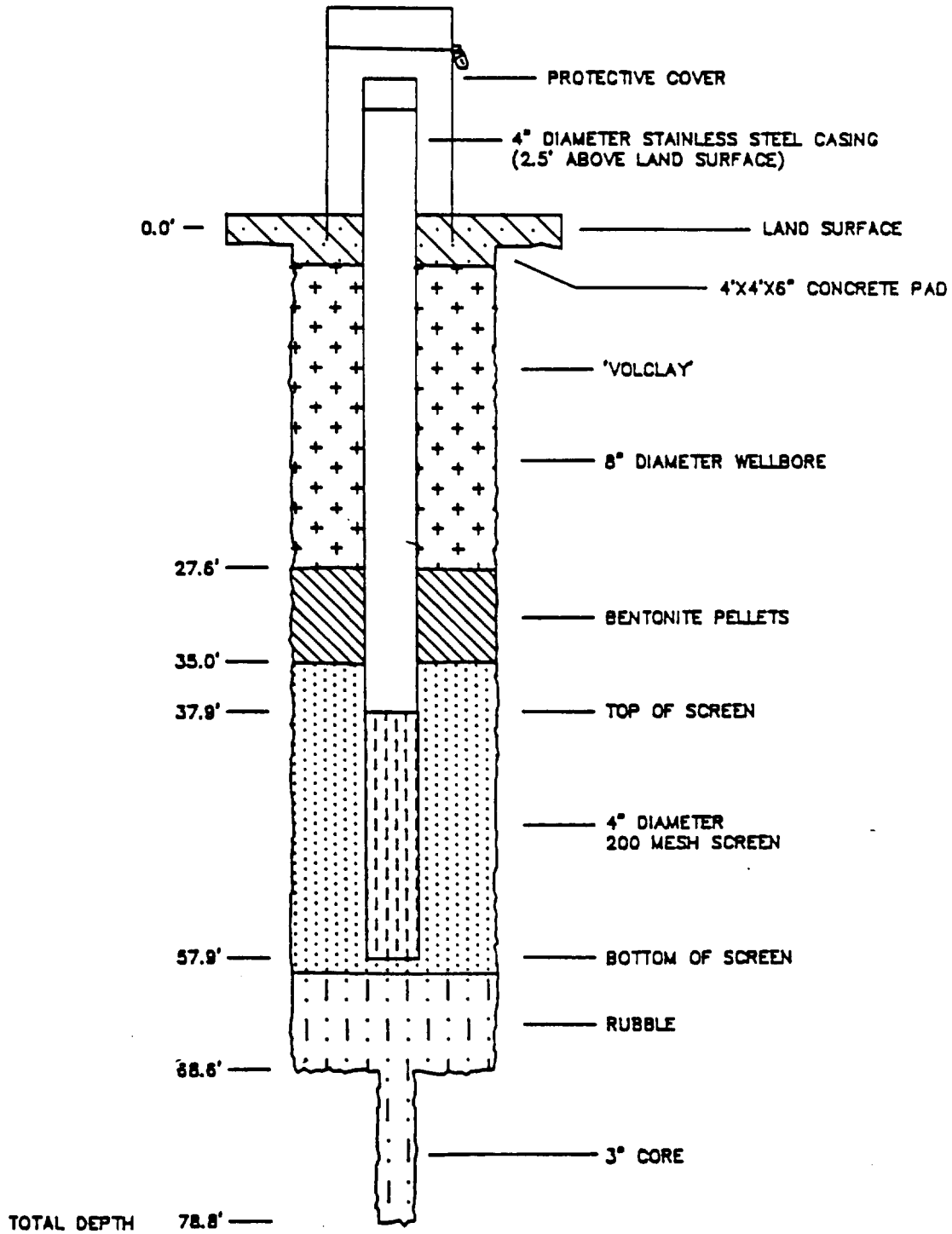
Signature of Observer: _____ Date: _____

C-DWIALTAYLOR.1/ALTOM.19
05/19/88

APPENDIX B

MONITOR WELL CONSTRUCTION DETAILS

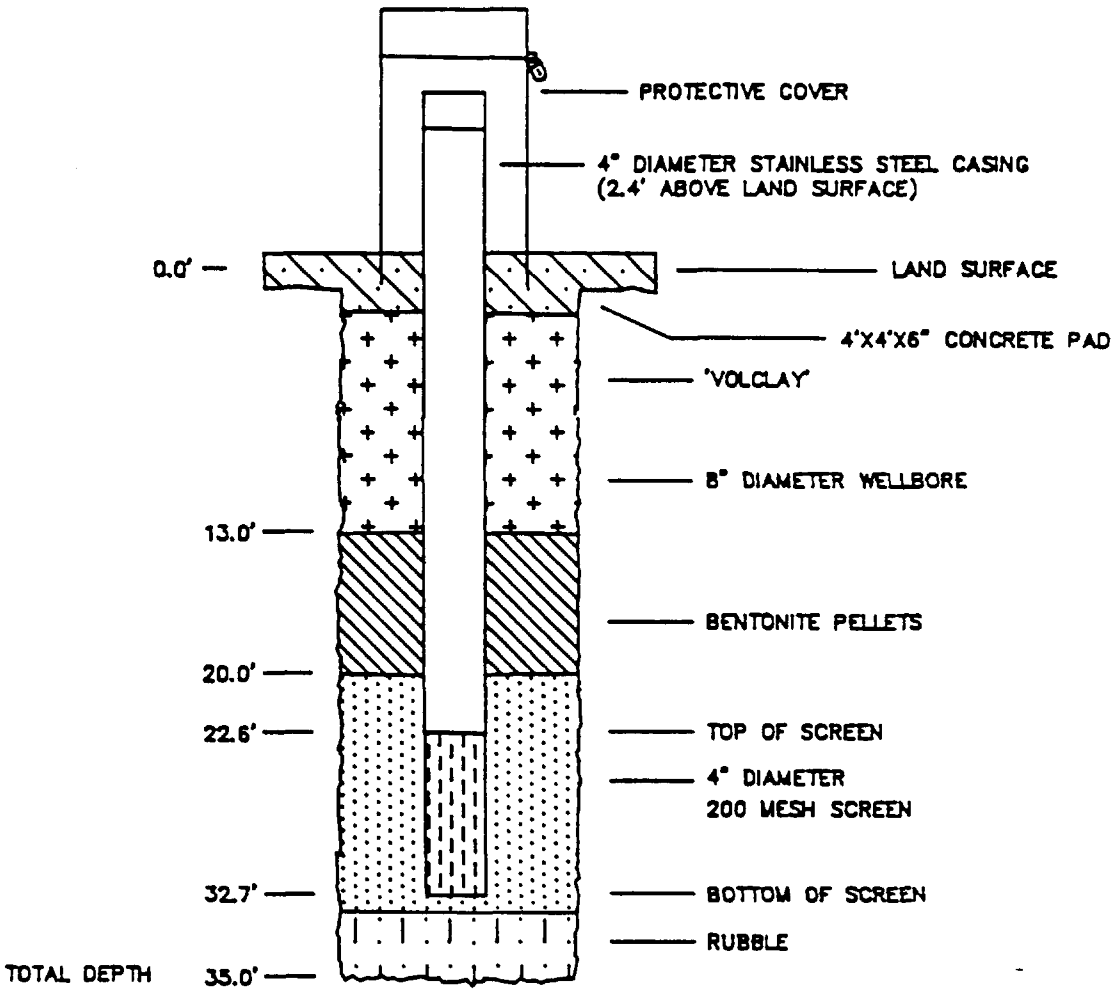
ALT-01



NOT TO SCALE

CTASA

ALT-02



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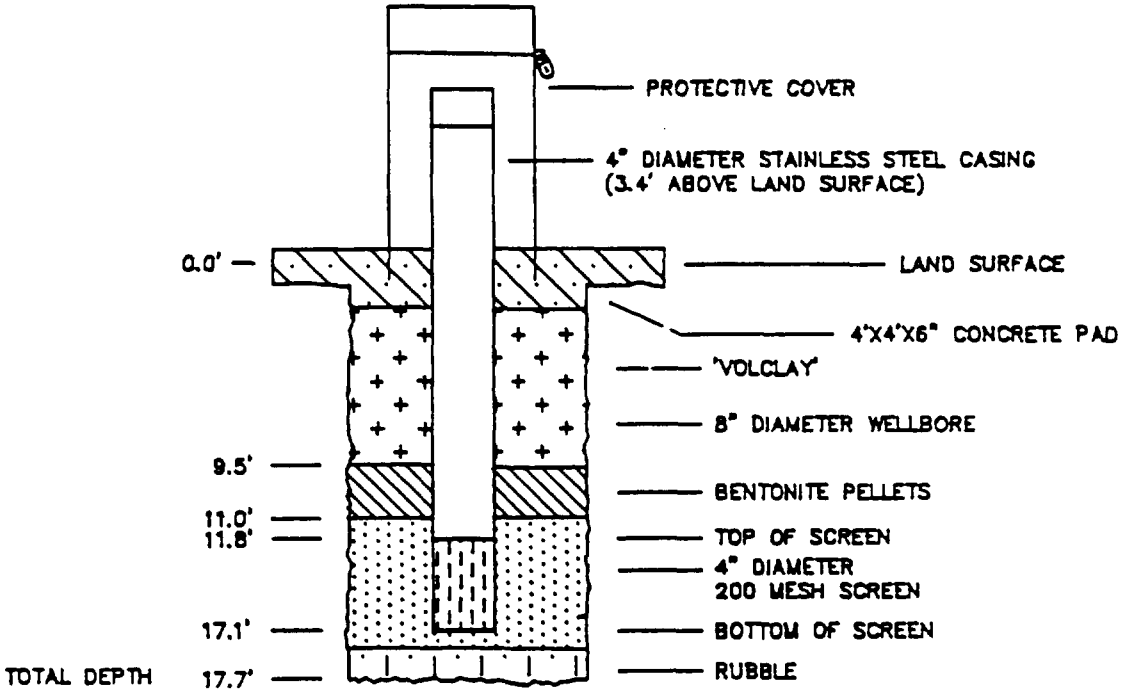

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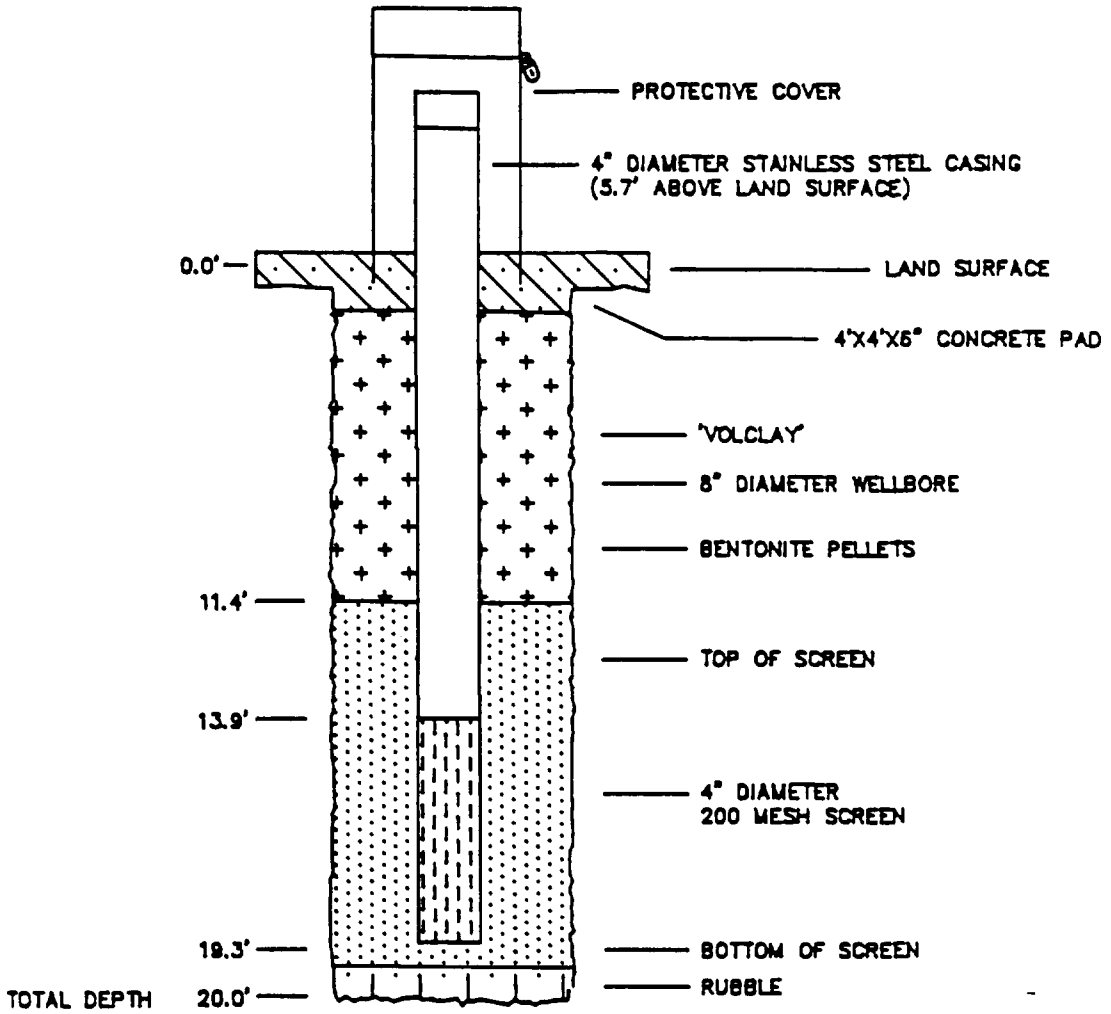

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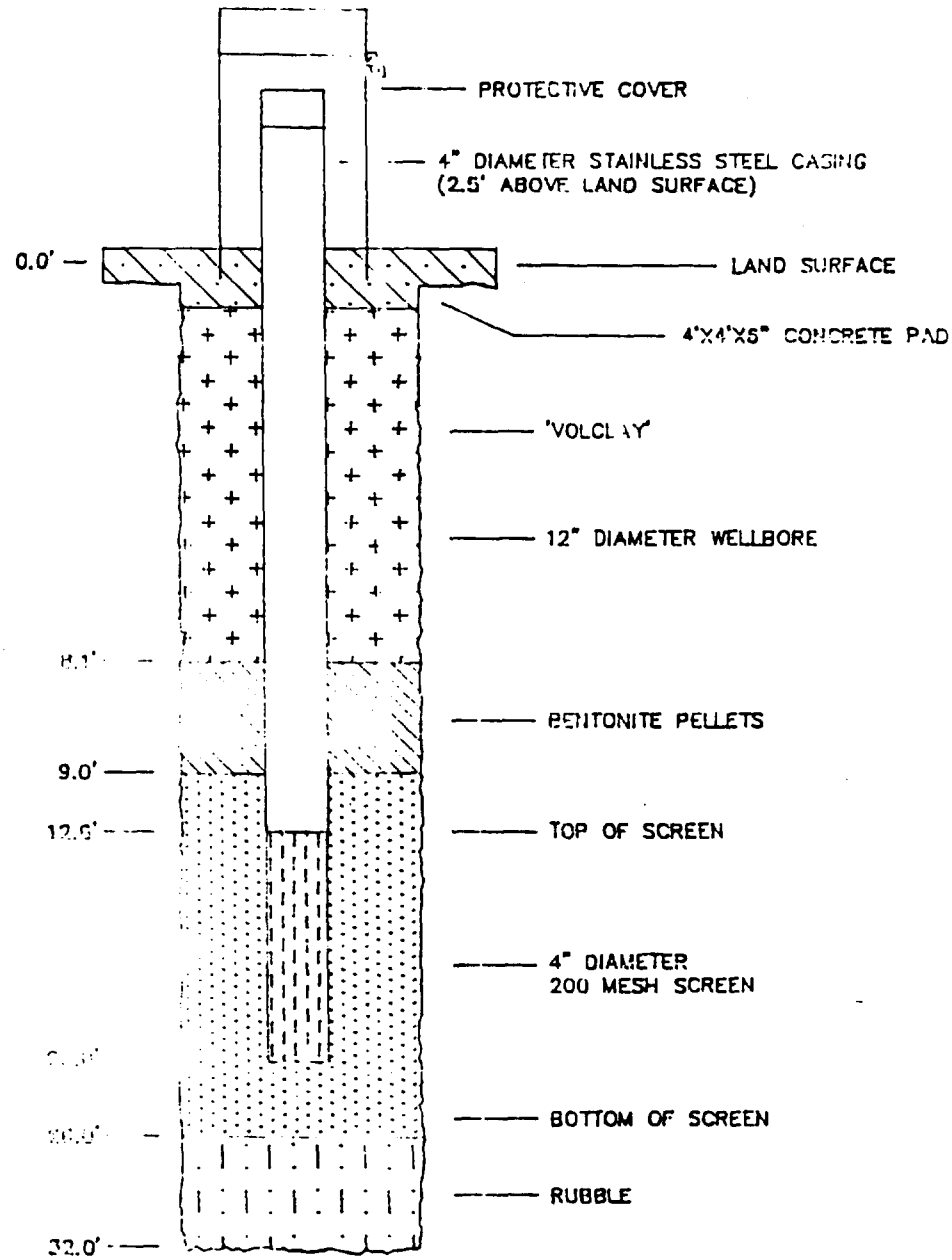
CTR&D

ALT-05



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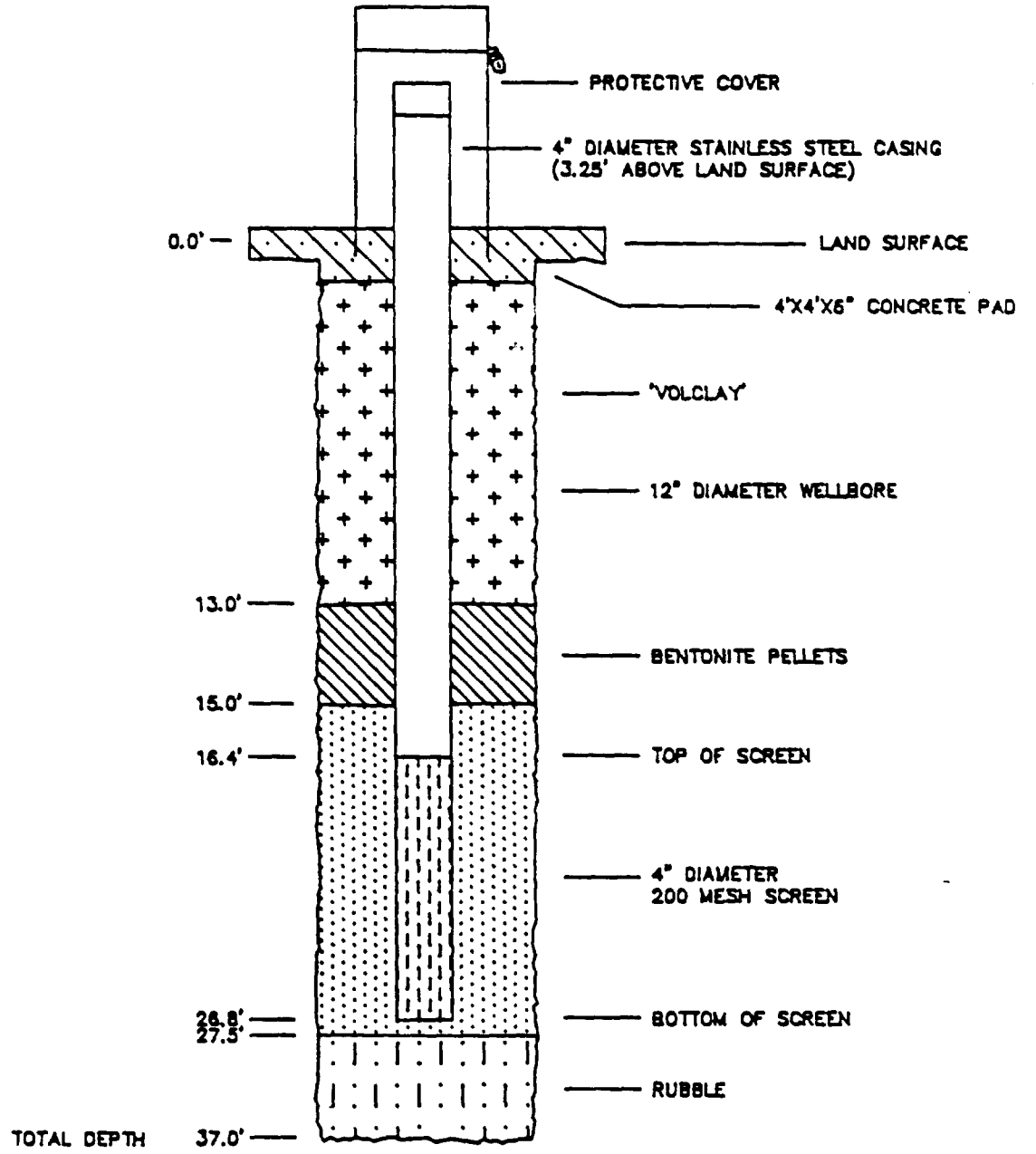
CTE15JE

ALT-06



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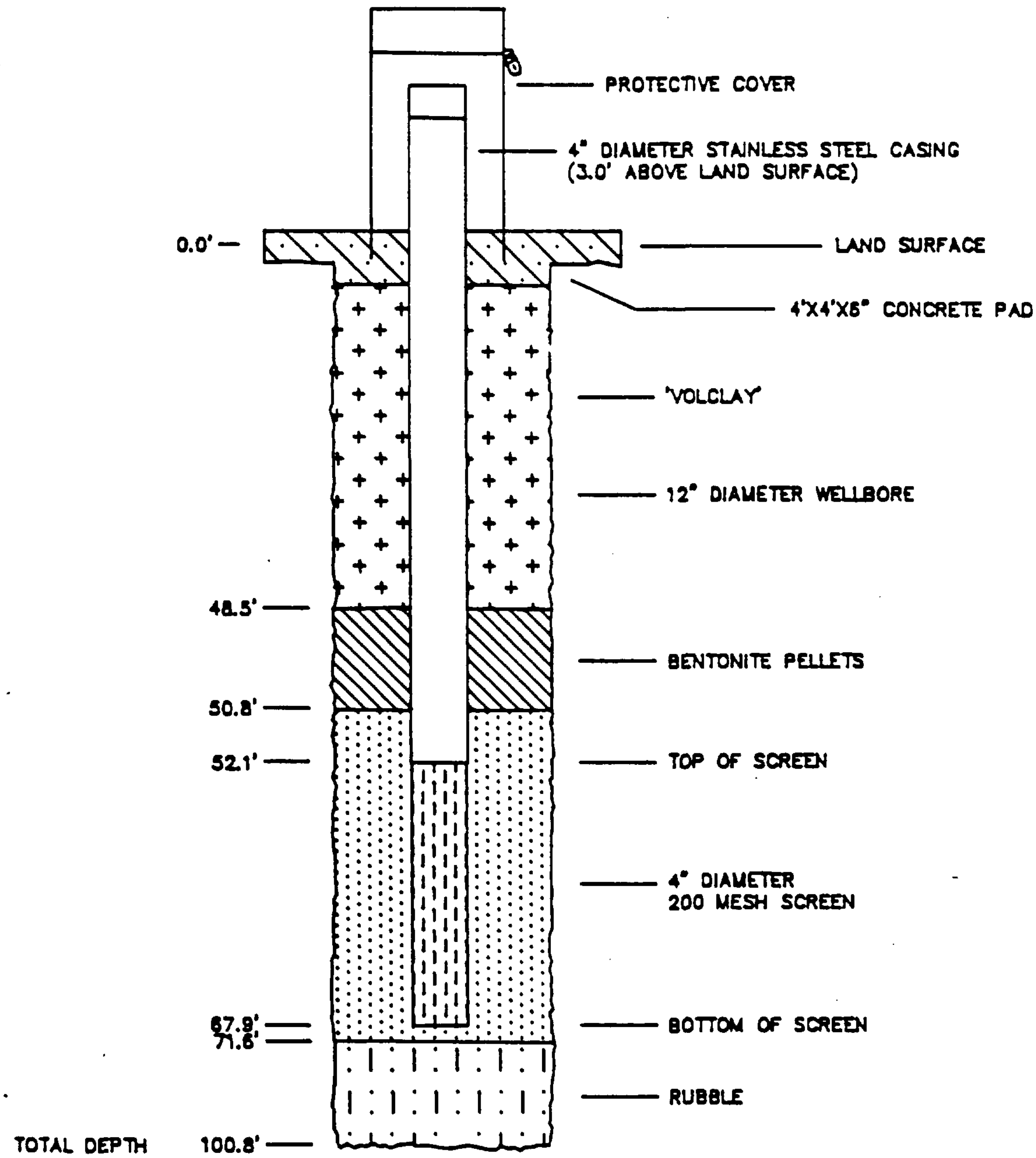

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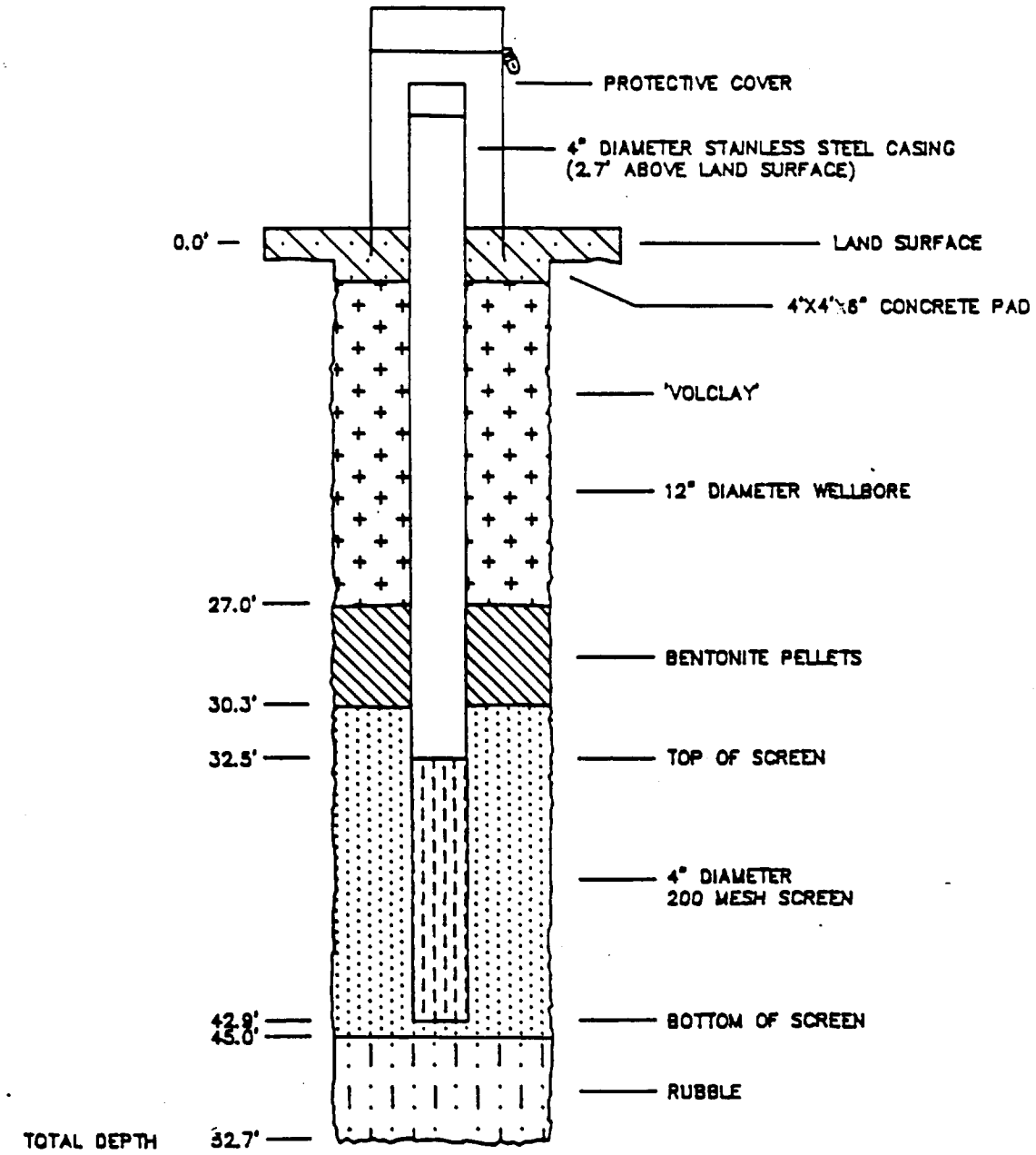

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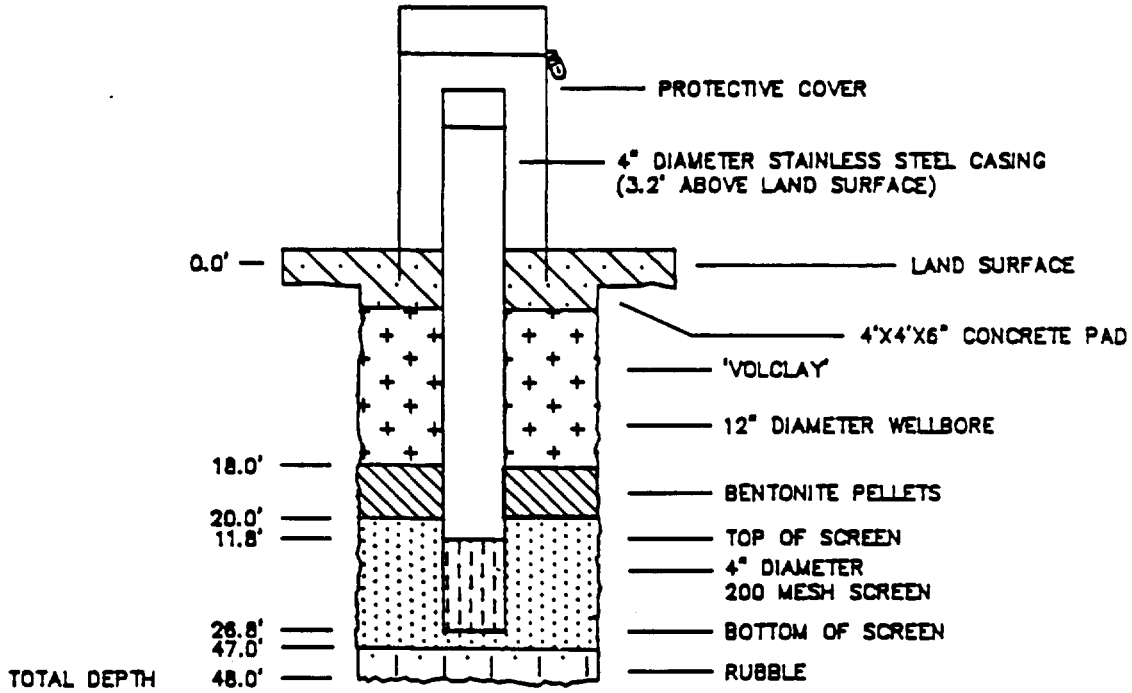

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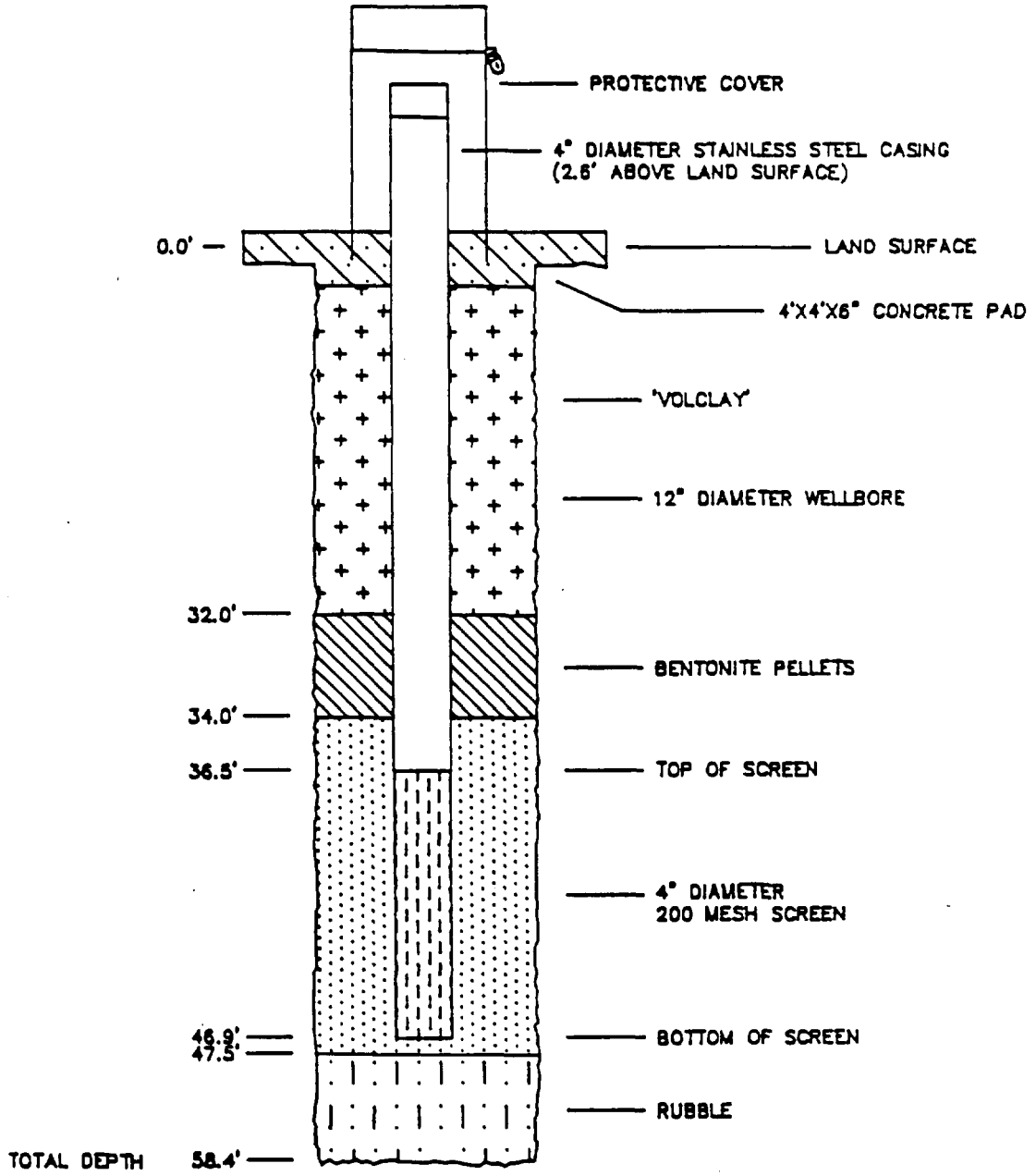

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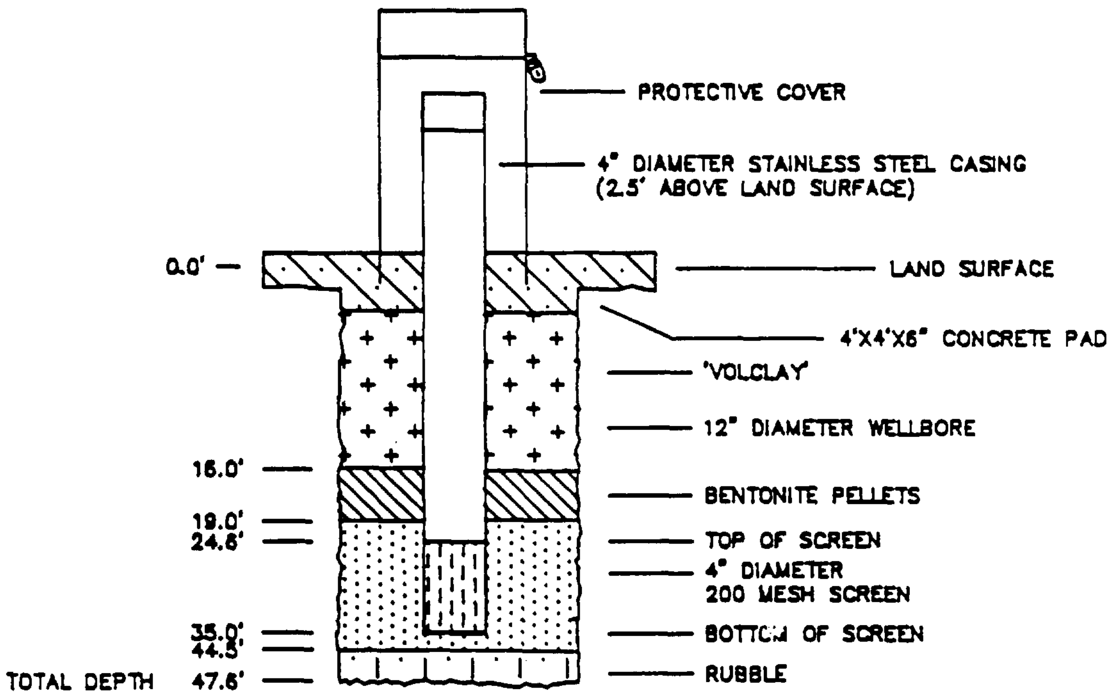

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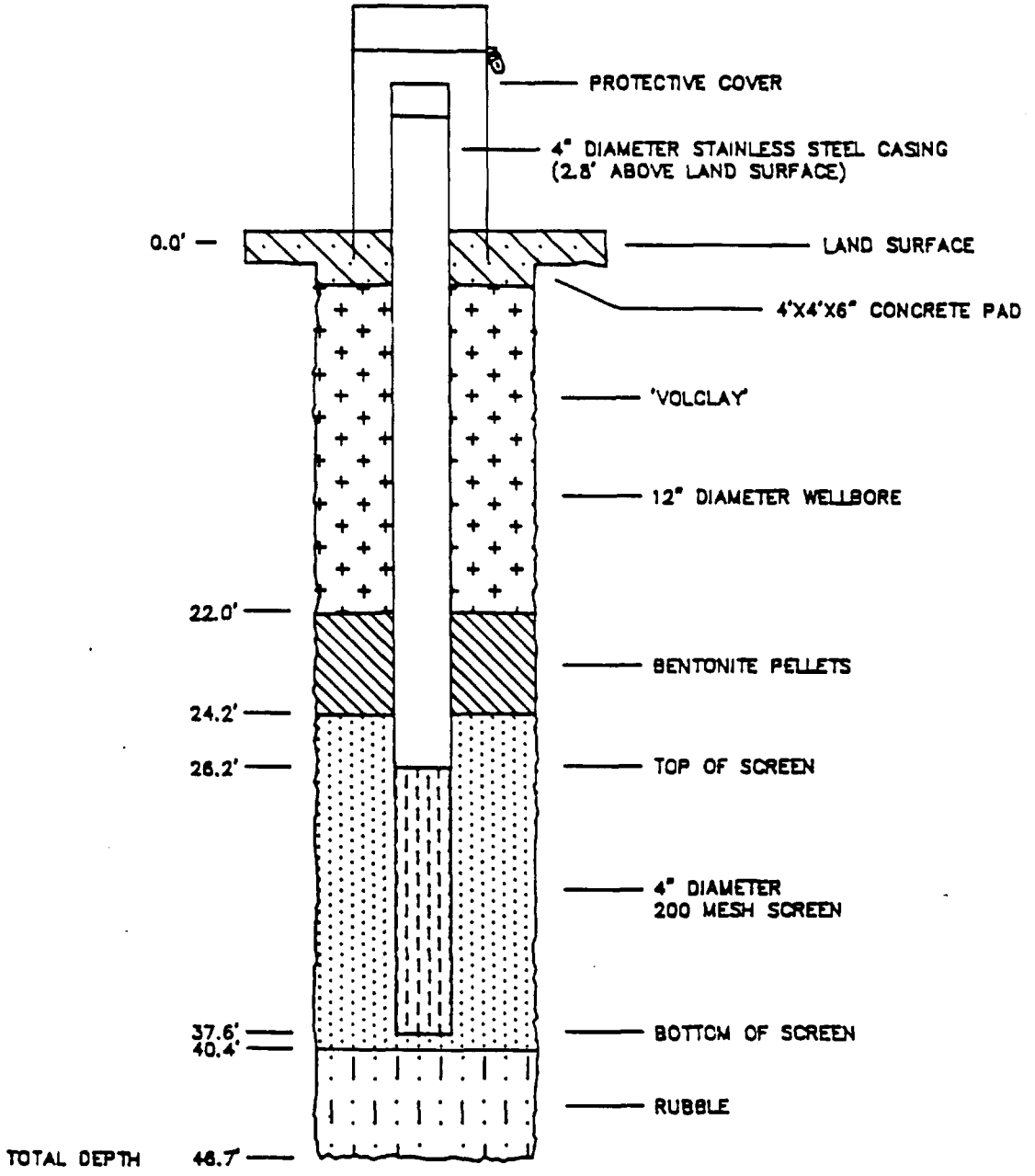
C17C183X

ALT-12



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